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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

vs.

UBER TECHNOLOGIES, INC.; OTTOMOTTO LLC; OTTO TRUCKING LLC,

Defendants.

CASE NO. 3:17-cv-00939

PLAINTIFF WAYMO LLC'S OFFER OF PROOF WITH RESPECT TO WAYMO'S DEVELOPMENT EXPENSES

PUBLIC REDACTED VERSION OF DOCUMENT SOUGHT TO BE SEALED

Trial Date: December 4, 2017

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I. INTRODUCTION

Each of the asserted trade secrets resulted from a development process that began in 2009, when Waymo decided to explore whether it was even possible for self-driving technology to be commercialized safely in the near term. Over the course of seven years, Waymo worked to identify and understand the myriad of problems that needed to be solved for autonomous vehicles to become feasible for widespread use in our lifetimes. How could every driving scenario be predicted and addressed? What hardware could provide the data needed to handle the relevant scenarios? Were lasers even necessary, or could radar, cameras, some other sensor, or some combination thereof be sufficient? How complex did each individual piece of hardware need to be to generate a sum total of data that would be sufficiently robust to address all possible driving scenarios? Can hardware of the necessary complexity be manufactured reliably or would the yield for certain designs be too low and thus cost-prohibitive? Could software algorithms and artificial intelligence fill in gaps in the data (or account for noise in the data), such that the hardware could be less complex and less costly? Or would the necessary "compute" power then overrun the system? Waymo was the first to identify the specific iterations of these questions and others that presented themselves at every step on the path toward commercializing self-driving technology. For Waymo, every tried and failed design, every solution to one hardware problem that created too many issues on the software side, every software solution that could make up for a simplified hardware implementation, every experience with manufacturing processes and yields – was necessary to bring Waymo to the precipice of success. And it was just when Waymo arrived at that precipice that Waymo's trade secrets were misappropriated.

The jury will hear how Waymo needed to bring to bear all of its research and development efforts to launch the first ever truly self-driving TaaS service. The jury will hear how Waymo's research and development efforts informed each specific asserted trade secret – from identifying the questions to be addressed and problems to be solved all the way to tweaking a particular implementation and validating the results. The costs of those efforts constitute relevant evidence that the asserted trade secrets are trade secrets (i.e., that they derive independent economic value from not being generally known), and the costs of those efforts constitute relevant evidence of the

value that Waymo and Uber would have ascribed to the asserted trade secrets at the time of the misappropriation.

II. OFFER OF PROOF

1) Waymo witnesses will testify about Waymo's initial decision to develop self-driving car technology. Waymo began its program as a "moonshot," at a time when the industry thought that fully autonomous vehicles were an impossibility, at least in our lifetimes. Dmitri Dolgov, who was one of Waymo's original employees and who currently leads the development of its self-driving technology, will testify that Waymo's initial goal was to understand the problems associated with self-driving in the real world. Dr. Dolgov will testify that, in 2009, research and development in the field was based on self-driving in controlled settings like the DARPA challenge courses. He will explain that Waymo was the first to focus on real-world driving. Waymo began developing its technology from the ground up, without knowing the specific nature of the problems it would encounter or even any success could be achieved in the near term.

2) Dr. Dolgov will testify that an integral and "but for" part of Waymo's technology development has been the accumulation of driven miles in its self-driving vehicles, whether in the real world or via simulation. Waymo has accumulated millions of these miles, which has allowed Waymo to collect enormous amounts of data about even rare events that a self-driving vehicle encounters in the real world. Waymo invests significant resources into the accumulation of test miles, with a dedicated fleet of test vehicles and operations drivers to seek out diverse real-world settings.

3) Dr. Dolgov and other Waymo engineers will explain that Waymo analyzes this data to determine the most critical scenarios that its technology must be able to handle. At least some Waymo witnesses refer to these critical scenarios as corner cases. Waymo witnesses will explain that the corner cases are the hardest problems that must be solved. These corner cases eventually become the critical test scenarios used at Waymo. The witnesses will testify that identifying the corner cases, defining them as test scenarios, and solving for them in the self-driving platform is an iterative process that requires extensive data analysis and testing. In some

instances, Waymo has defined a test scenario too simplistically only to realize through driving more miles that the problem is more complex than Waymo's proposed solution had anticipated. In other instances, testing reveals that Waymo has defined a test scenario as too complex, leading to an unnecessarily complicated and costly design. Waymo witnesses will testify that, especially in its early years of development, Waymo dedicated significant resources to identify and refine its test scenarios in order to capture the set that could define the requirements for a safe, commercially feasible self-driving car.

4) There will be evidence introduced at trial demonstrating that the importance of driving "real miles" to inform research and development efforts was not lost on Uber. Jeff Holden, Uber's Chief Product Officer, has testified that Uber had done [redacted] (Ex. 1 [Holden 8/15/17 Depo. Tr.] at 91:24-92:1.) And John Bares, a Director in Uber's ATG group, believed such limited real-world testing was a problem: he testified that, in the first half of 2016 (as Uber was negotiating the Otto acquisition), he was "in a pretty low place because we were getting beat up on real miles. We were -- Google was logging 15,000 a week, and we were at zero a week." (Ex. 2 [Bares 8/11/17 Depo. Tr.] at 475:20-476:1.)

5) Waymo's engineers will explain that creating a set of hardware requirements from its understanding of the test scenarios (derived from driving real-world and simulated miles) that should be solved by the overall self-driving platform is a complex process that involves coordination among multiple teams within Waymo. For example, Dr. Dolgov will explain that the design and development process for Waymo's LiDAR sensors implicates the balancing of a variety of factors across all hardware and software capabilities. If the hardware team reduces the complexity of a sensor so that it can be manufactured more easily or so that it can better meet cost or space goals, then the software team may have to develop more complex algorithms to process the less robust data that the sensor collects (or the software team may determine that the data generated by the less complex hardware is too noisy or non-uniform to be useful at all without burdening the overall system with excessive "compute" requirements). If, on the other hand, the hardware team increases the sophistication of a sensor so that it produces richer data, then some software algorithms may be simplified, but the hardware may prove too costly, too big,

or too complex for mass manufacture. Dr. Dolgov will explain how this necessarily iterative balancing has led Waymo to dead ends, significant design changes, and important design tweaks, which eventually led Waymo to the asserted trade secrets.

6) For example, Waymo developed a version of its short-range LiDAR sensor, called TBr, with a hardware design that included [redacted] But, after building and testing TBr, Waymo determined that [redacted] The software team also encountered unexpected difficulties fusing the TBr data with more robust data from Waymo's in-development and necessarily more complex medium-range sensor. This led to complications such as [redacted]. And this is just a small number of the issues Waymo needed to address in the context of this particular aspect and iteration of development.

7) Dr. Dolgov will also testify that some issues do not even immediately present themselves in this way. The development process requires extensive testing and evaluation to determine whether Waymo's LiDAR sensors meet its defined test scenarios and performance requirements after proposed solutions are implemented. After Waymo designs and prototypes a sensor, it tests the sensor in three different settings: the real world, simulated test environments, and controlled "structured test" environments. The simulated and structured test environments allow Waymo to replicate its test scenarios and to evaluate how well the LiDAR sensors, other hardware, or a combination thereof are able to detect the scenarios and how well software is able to process the resulting data to classify objects and make driving decisions. The real world tests have at times raised new issues not identified by the other test environments. Dr. Dolgov and other Waymo engineers will provide examples of how the testing and evaluation process has led to significant hardware and software design iterations, especially in the early years of the research and development process.

8) There will be evidence at trial that this reality of the development process was also

known to Uber. [redacted] (Ex. 3 [TX-0085], at 11-12.) Later, Uber's internal test plan for its Fuji sensor similarly recognized [redacted]. (Ex. 4 [TX-124].)

9) The evidence at trial will show that each of the asserted trade secrets resulted from the development process discussed above. Said differently, Waymo's extensive investments into iterative, cross-functional development process were necessary for Waymo to arrive at the trade secrets, and much of the value of the trade secrets resides in the fact that they resulted from just this time and resource intensive process.

2. *Trade Secret No. 2*

10) Trade Secret No. 2 is directed to [redacted] of Waymo's GBr3 LiDAR device. Waymo engineers will testify that Waymo arrived at [redacted] only as a result of the research and development cycles described in paragraphs 1 through 9 above.

11) For example, Waymo engineers will testify that the [redacted] requirements for Waymo's mid-range LiDAR could be defined only in conjunction with identifying, describing, testing, and refining the test scenarios that Waymo created to ensure the safety of its self-driving technology and proposing potential combinations of hardware and software to solve those test scenarios in a way that not only works but also minimizes complexity and maximizes reliability across the self-driving platform. Waymo engineers will testify that the question of how to [redacted] in a LiDAR device was an integral part of that overall design process.

12) Those engineers will testify that [redacted] thus affecting the resolution of the data generated and the usefulness of that data to solve different test scenarios. [redacted] must meet physical requirements related to, for example, space, manufacturing, and cost. The software must be able to process the data

generated by the LiDAR, accounting for the differences in data sets caused by [redacted] And so on.

13) Waymo engineers will testify that, in early generations of its medium-range LiDAR sensor, GBr, Waymo determined that [redacted] Over time, however, Waymo came to understand that [redacted] because its then current combination of LiDAR, radar, cameras, software, and other technology could not meet certain difficult test scenarios. In particular, Waymo determined from its ongoing test driving that [redacted] was needed from its mid-range LiDAR in order for the self-driving system as a whole to classify, identify, define, and make decisions in response to a small subset of these test scenarios.

14) Among other things, Waymo originally considered [redacted] But Waymo engineer Pierre Droz will testify about how Waymo's LiDAR team arrived at a better solution. Waymo had previously thought that the [redacted] But, from its experience manufacturing GBr2, Waymo intuited that it could likely [redacted] This would result in [redacted] that could result in the necessary [redacted] Mr. Droz will testify that testing has revealed that the arrangement met Waymo's [redacted] requirements, that manufacturing has proven out the feasibility of [redacted] and overall design, that the changes did not significantly increase the complexity of the software needed to process the resulting data, and that the design has become a critical element for the third generation of Waymo's GBr medium-range LiDAR sensor.

15) Waymo testimony and documentary evidence will show that the research and development that was necessary before Waymo could arrive at this trade secret cost

approximately $1.1 billion. That is not to say that all of the benefits derived from that research and development are discernible from the acquisition of this trade secret alone or that all of the benefits derived from that research and development can be obtained from the misappropriation of this trade secret alone. Indeed, the value of that research and development in its full form (all of the data, all of the learning, all of the analysis, all of the experience) would be worth many times Waymo's $1.1 billion investment, at least by any measure of Waymo, Uber, and many market analysts. Nevertheless, the evidence will show that Trade Secret No. 2 was informed by – and would not exist without – Waymo's expenditure of $1.1 billion in research and development. Indeed, that is exactly what makes the trade secret – even in and of itself – so valuable.

3. *Trade Secret Nos. 7 and 9*

16) Trade Secret Nos. 7 and 9 relate to [redacted] n Waymo's LiDAR devices. Waymo engineers will testify that Waymo arrived at these trade secrets only as a result of the research and development cycles described in paragraphs 1 through 9 above. The engineers will explain that these trade secrets were developed in response to [redacted]

17) For example, Waymo engineers will testify that [redacted] Waymo engineers will testify that, as a result, [redacted]

18) Waymo's engineers will explain that, after multiple design iterations, Waymo proposed that [redacted] In order to implement

that solution, however, Waymo had to figure out (among other things) how to [redacted] In connection with working on that problem, Waymo engineers hypothesized that [redacted]

19) Waymo engineers will testify that, once these solutions were proposed, the details of the FAC lens had to be specified, suppliers for the lens had to be procured, and techniques for [redacted] had to be developed. The hardware had to be manufactured and tested to see if it solved all or some of [redacted] while still meeting other sensor and system requirements and without introducing new problems. Ultimately, for example, there needed to be more analysis and testing of the [redacted] to ensure that drawbacks, such as [redacted], could be overcome and to ensure that reliable techniques for [redacted] could be developed.

20) Waymo testimony and documentary evidence will show that the research and development that was necessary before Waymo could arrive at these trade secrets cost approximately $120 million. That is not to say that all of the benefits derived from that research and development are discernible from the acquisition of these trade secrets alone or that all of the benefits derived from that research and development can be obtained from the misappropriation of these trade secrets. Indeed, the value of that research and development in its full form (all of the data, all of the learning, all of the analysis, all of the experience) would be worth many times Waymo's investment, at least by any measure of Waymo, Uber, and many market analysts. Nevertheless, the evidence will show that Trade Secret Nos. 7 and 9 were informed by – and they would not exist without – Waymo's expenditure of approximately $120 million in research and development. Indeed, that is exactly what makes these trade secrets so valuable.

4. *Trade Secret Nos. 13 and 14*

21) Trade Secret Nos. 13 and 14 are also directed to techniques for [redacted] Waymo engineers will

testify that Waymo arrived at these trade secrets only as a result of the research and development cycles described in paragraphs 1 through 9 above. Waymo engineers will testify that these development cycles revealed that [redacted] could play a critical role in achieving performance goals under various other constraints, but [redacted] involved various challenges from a manufacturing and cost perspective.

22) During the design and build process for an early LiDAR design, GBr, Waymo observed that [redacted]. Waymo engineers will testify that they researched and evaluated different techniques for addressing [redacted] Waymo evaluated the different options against cost, supply, and performance requirements and ultimately developed a technique – described in Trade Secret No. 13 – that would meet its criteria.

23) Also during the design and build process for GBr, Waymo developed a technique to help enable [redacted] Waymo engineers will testify that they researched and evaluated different techniques for improving [redacted] and eventually arrived at a technique – described in Trade Secret No. 14 – that allowed for [redacted]

24) Waymo testimony and documentary evidence will show that the research and development that was necessary before Waymo could arrive at these trade secrets cost approximately $120 million. That is not to say that all of the benefits derived from that research and development are discernible from the acquisition of these trade secrets alone or that all of the benefits derived from that research and development can be obtained from the misappropriation of these trade secrets. Indeed, the value of that research and development in its full form (all of

the data, all of the learning, all of the analysis, all of the experience) would be worth many times Waymo's investment, at least by any measure of Waymo, Uber, and many market analysts. Nevertheless, the evidence will show that Trade Secret Nos. 13 and 14 were informed by – and they would not exist without – Waymo's expenditure of approximately $120 million in research and development. Indeed, that is exactly what makes these trade secrets so valuable.

5. *Trade Secret No. 25*

25) Trade Secret No. 25 relates to Waymo's self-driving car test scenarios and sensor requirements. Waymo engineers including Dr. Dolgov will testify that these test scenarios and requirements resulted from six years of development work. The engineers will explain that [redacted]

26) Waymo engineers will explain that Waymo drives millions of real-world test miles in order to accumulate data about the types of objects, environments, and conditions that vehicles encounter. The engineers will testify that, after collecting this data, it is analyzed it to identify and define test scenarios that Waymo's self-driving platform must be able to address. For example, Waymo engineer Ben Ingram testified that Waymo's sensing parameters are "things that, through the years of driving and the millions of miles in driving that we've done, we have come to understand are likely to drive a LiDAR design." (Ex. 5 [Ingram 8/16/17 Depo.Tr.] at 63:10-63:13.) Waymo's technical expert Dr. Hesselink similarly testified that "there is significant value for somebody who has just gone through this process over at Waymo where one and a half million miles or so have apparently been driven." (Ex. 6 [Hesselink 9/26/17 Depo. Tr.] at 118:7-10.) Specifically, the miles that Waymo has driven are "actionable" because they allow "a designer of the LiDAR and of the software to come up with specific solutions to solve." (*Id.* at 118:11-15.)

27) Waymo engineers will further explain that extensive data collection and analysis was the *only* way to develop these test scenarios because the problem Waymo was trying to solve was previously undefined; no other companies or researchers had attempted to define the

scenarios that a LiDAR sensor for a fully autonomous self-driving vehicle should detect in the real world.

28) The evidence will establish that the scenarios described in Trade Secret No. 25 are carefully chosen to ensure that Waymo's sensors are able to detect anticipated and unanticipated events in real-world driving conditions. Dr. Dolgov and other Waymo engineers will explain that Waymo refers to the most critical scenarios as "corner cases." These corner cases represent the hardest problems that must be solved in order for the sensor to work in a real world setting. The goal is to get to a place where it is reasonable to conclude that, if a sensor meets each of the corner cases, then it should be able to handle any unanticipated scenarios that it encounters in the real world.

29) The witnesses will testify that identifying and selecting Waymo's test scenarios is an iterative process that requires extensive data analysis and testing. In some instances, Waymo has defined the test scenarios too simplistically only to determine through testing that the problem is more complex than Waymo had anticipated. In other instances, testing reveals that Waymo's test scenarios were too complex and would lead to an unnecessarily complicated sensor design.

30) Waymo engineers will further testify that, based on the test scenarios, Waymo develops hardware requirements for its different sensors (*e.g.*, short-range, medium-range, long-range LIDAR, radar, cameras, etc.) and that these requirements are protected by Trade Secret No. 25. The requirements include information such as [redacted] After the requirements are defined, Waymo prototypes sensors to meet the requirements and tests the sensors in the real world and in simulated environments to determine whether they meet the defined test scenarios.

31) Waymo engineers will explain that developing a set of hardware requirements involves coordination among multiple teams within Waymo. For a given test scenario, Waymo engineers determine what data is required from each sensor (*e.g.*, LiDAR, radar, cameras). Waymo's LiDAR team then combines the LiDAR requirements into specifications for its different LiDAR sensors (*e.g.*, short-range, medium-range, and long-range). The specifications

include requirements like [redacted]—all of which are selected to meet Waymo's test scenarios. Waymo then designs and builds its LiDAR sensors to meet these specifications.

32) Waymo engineers will explain that the design and development process for Waymo's LiDAR sensors involves balancing hardware and software capabilities. If the hardware team develops a less expensive or easier to manufacture sensor, then the software team may have to develop more complex algorithms in order to process the data that the sensor collects. Or the software team may determine that the data is too noisy or non-uniform to be useful. If, on the other hand, the hardware team develops a sophisticated sensor that produces rich data, then it simplifies the software development. These tradeoffs influenced the sensor requirements protected by Trade Secret No. 25.

33) Waymo testimony and documentary evidence will show that the research and development that was necessary before Waymo could arrive at this trade secret cost approximately $1.1 billion. That is not to say that all of the benefits derived from that research and development are discernible from the acquisition of this trade secret alone or that all of the benefits derived from that research and development can be obtained from the misappropriation of this trade secret alone. Indeed, the value of that research and development in its full form (all of the data, all of the learning, all of the analysis, all of the experience) would be worth many times Waymo's $1.1 billion investment, at least by any measure of Waymo, Uber, and many market analysts. Nevertheless, the evidence will show that Trade Secret No. 25 was informed by, and would not exist without, Waymo's expenditure of $1.1 billion in research and development.

6. *Trade Secret No. 90*

34) Trade Secret No. 90 relates to fiber laser technology developed by Waymo for long-range LiDAR. Long-range detection allows its self-driving vehicles to identify and classify objects such as [redacted] Waymo engineers will testify that Waymo arrived at its fiber laser technology as a result of research and development cycles as described in paragraphs 1 through 9 above.

35) As just one example, Waymo engineers will testify that they considered different

sensors for long-range detection, including radar and cameras, but came to believe that these sensors would continue to have problems detecting certain scenarios like [redacted] and that software would not be able to resolve those problems. Waymo ultimately proposed a fiber-based LiDAR sensor as a potential solution for long-range detection. Waymo initially [redacted] to meet Waymo's performance requirements at an appropriate cost. These efforts ultimately failed and Waymo decided to develop its own custom fiber laser technology, Trade Secret No. 90.

36) The evidence will be that Waymo's custom fiber laser technology resulted from several years of research, development, and testing work, including over seven different versions of a long range fiber-based laser. All of this work was informed by experiences with short and medium range LiDAR, combining and processing different LiDAR outputs using different software algorithms, and learnings derived from different implementations of the self-driving platform as a whole.

37) Waymo testimony and documentary evidence will show that the research and development that was necessary before Waymo could arrive at this trade secret cost approximately $1.1 billion. That is not to say that all of the benefits derived from that research and development are discernible from the acquisition of this trade secret alone or that all of the benefits derived from that research and development can be obtained from the misappropriation of this trade secret. Indeed, the value of that research and development in its full form (all of the data, all of the learning, all of the analysis, all of the experience) would be worth many times Waymo's investment, at least by any measure of Waymo, Uber, and many market analysts. Nevertheless, the evidence will show that Trade Secret 90 was informed by – and would not exist without – Waymo's expenditure of approximately $1.1 billion in research and development. Indeed, that is exactly what makes this trade secret so valuable.

7. *Trade Secret No. 111*

38) Trade Secret No. 111 relates to know-how regarding the risks and costs of a [redacted] LiDAR system. Waymo engineers will testify

that one of their early LiDAR designs called Mama Bear ("MBr") used a [redacted] The engineers will explain that Waymo considered the MBr design to be beneficial from a hardware perspective because [redacted] The engineers will further testify that Waymo spent more than a year on the research and development of MBr, including designing, building, and testing prototypes. (See Ex. 7 [TX-1824].)

39) As outlined in paragraphs 1 through 9 above, Dr. Dolgov will explain that the design and development process for Waymo's LiDAR sensors involves balancing hardware and software capabilities. If the hardware team develops a less expensive or easier to manufacture sensor, then the software team may have to develop more complex algorithms in order to process the data that the sensor collects. Or the software team may determine that the data is too noisy or non-uniform to be useful. Dr. Dolgov will testify that this was the case with MBr. After expending significant resources designing and developing an MBr prototype, Waymo's software team determined that sensor [redacted]

40) After a substantial investigation over the course of a month, Waymo determined that the problem resulted from [redacted]—a problem that Waymo could not have anticipated at the outset of the design process. Waymo engineers will testify that they attempted to develop a solution, including [redacted] Ultimately, Waymo determined that a solution was not feasible for self-driving and abandoned the MBr design in favor of GBr, [redacted]

41) Waymo testimony and documentary evidence will show that the research and development costs associated with Waymo's work on its [redacted], as recited in Trade Secret No. 111, totaled approximately $50 million.

III. THE COSTS OF DEVELOPING THE ASSERTED TRADE SECRETS ARE RELEVANT TO WHETHER THE INFORMATION HAS INDEPENDENT

ECONOMIC VALUE

As plaintiff, Waymo bears the burden of proving that each of the asserted trade secrets is a protectable trade secret. *Language Line Servs., Inc. v. Language Servs. Assocs., Inc.*, 944 F. Supp. 2d 775, 779-80 (N.D. Cal. 2013). To qualify as a trade secret, information must derive actual or potential independent economic value from not being generally known. *MAI Systems Corp. v. Peak Comp. Inc.,* 991 F.2d 511, 520-21 (9th Cir. 1993). Evidence of the substantial investment of time and money expended by Waymo to develop the asserted trade secrets is relevant to this economic value inquiry. *Calif. Intern. Chem. Co., Inc. v. Sister H. Corp.*, 168 F.3d 498, 1999 WL 50891 at *3 (9th Cir. 1999) (technology was a trade secret where the evidence strongly indicated that it had value because developing it required "a substantial expenditure of time and money"); *see also Copart, Inc. v. Sparta Consulting, Inc.*, 2017 WL 4269921, at *15 (E.D. Cal. 2017) (noting that "circumstantial evidence of [a plaintiff's] investment of resources in producing the information" is relevant to establishing its trade secret status and finding plaintiff's investment of two years and $10 million designing and building the system at issue relevant to that inquiry); *Shapiro v. Hasbro, Inc.*, 2016 WL 9176559, *12 (C.D. Cal. 2016) (independent economic value can be established by circumstantial evidence, including of "the amount of resources invested by the plaintiff in the production of the information"). Generally, "the more difficult information is to obtain, and the more time and resources expended … in gathering it, the more likely a court will find such information constitutes a trade secret." *Morlife, Inc. v. Perry*, 56 Cal. App. 4th 1514, 1522 (1997); *Farmers Ins. Exch. v. Steele Ins. Agency, Inc*., 2013 WL 2151553, at *7 (E.D. Cal. 2013) (finding customer list information a protectable trade secret where plaintiff invested "significant time, labor and capital" in compiling it). In this context, even "negative" information, such as "the results of lengthy and expensive research which proves that a certain process will not work," has value. *Spring Design,* 2010 WL 5422556, at *5 (N.D.Cal. 2010) (quoting *Courtesy Temp. Serv. v. Camacho*, 222 Cal.App.3d 1278, 1287 (Cal. Ct. App. 1990)).

Waymo has offered significant proof regarding the extent of the research and development that was required for Waymo to arrive at its trade secrets. Waymo has also offered significant proof as to why those research and development efforts were necessarily so extensive. Waymo

was the first to develop a self-driving platform for commercial use. It did so from the ground up. It did so without knowing what problems would arise, which technologies might be used to address those problems, or what iterations of those technologies could ultimately be combined into a low cost, reliable, and safe system. Waymo had to expend substantial time and resources to develop its trade secrets, and that very fact establishes their independent economic value.

At trial, Uber intends to dispute that Waymo's asserted trade secrets deserve trade secret protection. (Dkt. 2519-3 [Joint Pre-Trial Order, Uber's Submission], at 4:4-5 ("[T]he alleged trade secrets are not protectable trade secrets under either DTSA or CUSTA.").) Waymo should be permitted to present the jury with all of its evidence, including its development costs, to meet its burden of proof on this issue.

IV. WAYMO'S DEVELOPMENT COSTS ARE RELEVANT TO DAMAGES

Evidence of the full cost to Waymo of developing the asserted trade secrets is also directly relevant to the amount of reasonable royalty damages to which Waymo is entitled. Royalty damages are calculated by reference to a hypothetical value that the parties "would have agreed to as a fair licensing price at the time that the misappropriation occurred." *Atlantic Inertial Systems Inc. v. Condor Pacific Industries of California, Inc.*, 2015 WL 3825318, at *4 (C.D. Cal. 2015). Development costs are often found relevant to that hypothetical value. *See Lucini Italia Co. v. Grappolini*, 2003 WL 1989605, *11 (N.D. Ill. 2003) ("the Court finds that a reasonable royalty would be at least the substantial sum [plaintiff] spent developing the information"); *University Computing Co. v. Lykes-Youngstown Corp.*, 504 F.2d 518, 539 (5th Cir. 1974) ("In calculating what a fair licensing price would have been had the parties agreed, the trier of fact should consider such factors as . . . the total value of the secret to the plaintiff, including the plaintiff's development costs."). Here, both Waymo and Uber would have come to the hypothetical negotiating table knowing full well that Waymo was years ahead of anyone else with respect to developing self-driving technology and that any licensed technology would reflect years of iterative work that was exclusively in Waymo's possession and that necessarily informed its trade secrets. Waymo would expect a reasonable licensing fee to acknowledge this value, and Uber would expect to pay a premium for trade secrets that resulted from Waymo's extensive

expenditure of time and money.

What is more, there will be substantial evidence in the record regarding the state of Uber's development program at the time of the misappropriation and the role of the asserted trade secrets in the context of the overall self-driving platform. Such evidence will offer the jury one or more paths (depending on their assessment of the evidence) for approximating[1] an unjust enrichment award based on an apportionment of Waymo's research and development costs. *GlobeRanger Corp. v. Software AG USA, Inc.*, 836 F.3d 477, 499-500 (5th Cir. 2016) (no abuse of discretion where expert presented evidence of research and development costs to support $19.7 million damages opinion on an unjust enrichment theory); *Bourns, Inc. v. Raychem Corp.*, 331 F.3d 704, 709-10 (9th Cir. 2003) (affirming "burn rate," or "development cost," of $3 million per year of saved development costs as an unjust enrichment award); *PQ Labs, Inc. v. Yang Qi,* 2014 WL 4954161, *5, *11 (N.D. Cal. 2014) (calculating amount defendants were unjustly enriched by referencing plaintiff's research and development costs); *Johns-Manville Corp. V. Guardian Industries Corp*., 718 F. Supp. 1310, 1315-16 (E.D. Mich. 1989) ("the Court finds the proper

[1] Courts recognize a distinction in the burden of proof required to show "the fact of damage" and "the extent of the damage." *Story Parchment Co v. Paterson Parchment Paper Co.*, 282 U.S. 555, 562-63 (1931) ("It is true that there was uncertainty as to the extent of the damage, but there was none as to the fact of damage; and there is a clear distinction between the measure of proof necessary to establish the fact that petitioner had sustained some damage and the measure of proof necessary to enable the jury to fix the amount . . . The wrongdoer is not entitled to complain that they cannot be measured with the exactness and precision that would be possible if the case, which he alone is responsible for making, were otherwise."); *Pace Indus., Inc. v. Three Phoenix Co.,* 813 F.3d 234, 240 (9th Cir. 1987) ("[U]ncertain damages, which prevent recovery, are distinguishable from uncertain extent of damage, which does not prevent recovery. The former denotes failure to establish an injury, while the latter denotes imprecision with regard to the scope or extent of the injury. The question of whether there is a right to recovery is not to be confused with the difficulty in ascertaining the scope or extent of the injury.") (internal citations omitted). Accordingly, once the fact of damages is established, juries are permitted to approximate damages based on existing evidence relevant to the value of the asserted trade secrets. *See Telex Corp. v. Int'l Bus. Mach. Corp.*, 367 F.Supp. 258, 309 (N.D. Okl. 1973) (court finding a "reasonable basis in the evidence to fairly approximate the damages"), *aff'd by Telex Corp. v. Int'l. Bus. Mach. Corp.,* 510 F.2d 894, 931 (10th Cir. 1975), *abrogated on other grounds by Novell, Inc. v. Microsoft Corp*., 731 F.3d 1064, 1072 (10th Cir. 2013) (affirming unjust enrichment damages award based on saved research costs where, "while such may not have been established with mathematical precision, they do meet the 'degree of likelihood' test. The fact that such damages may be difficult to pin down should not militate in favor of the wrongdoer.)

measure of unjust enrichment in this case is the entire sum that [the plaintiff] expended in developing the HERM technology that [the defendant] misappropriated."). In *Syntron Bioresearch, Inc. v. Fan*, 2002 WL 660446, at *12 (Cal. App. 4th 2002), the court affirmed an unjust enrichment award based on "75 percent of Syntron's research and development costs incurred from 1990 through 1997." *Id.* (internal quotations omitted). Even where defendant argued that this "apportionment does not reasonably reflect the unjust enrichment for those trade secrets actually misappropriated" because plaintiff's witness acknowledged that it would be "difficult to segregate research and development costs on a product-by-product basis because Syntron simply did not do so in its accounting," the Court of Appeal affirmed. *Id.* It noted that, "[g]ranted, the court's $2.7 million unjust enrichment award may not have been established with mathematical precision. Nevertheless, it is reasonable in light of the whole record, as the difficulty in ascertaining damages 'should not militate in favor of the wrongdoer.'"

V. CONCLUSION

For the foregoing reasons, the Court should allow Waymo to elicit testimony and introduce evidence regarding its development expenses as described herein.

DATED: January 26, 2018

QUINN EMANUEL URQUHART & SULLIVAN, LLP

By */s/ Charles K. Verhoeven*
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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA, SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

vs.

UBER TECHNOLOGIES, INC.; OTTOMOTTO LLC; OTTO TRUCKING LLC,

Defendants.

CASE NO. 3:17-cv-00939-WHA

DECLARATION OF JEFF NARDINELLI IN SUPPORT OF WAYMO LLC'S OFFER OF PROOF WITH RESPECT TO WAYMO'S DEVELOPMENT EXPENSES

I, Jeff Nardinelli, hereby declare as follows.

1. I am a member of the bar of the State of California and an associate with Quinn Emanuel Urquhart & Sullivan, LLP, counsel for Plaintiff Waymo LLC ("Waymo"). I make this declaration of personal, firsthand knowledge, and if called and sworn as a witness, I could and would testify competently as follows.

2. Attached as Exhibit 1 is a true and correct excerpted copy of the August 15, 2017 deposition of Jeff Holden.

3. Attached as Exhibit 2 is a true and correct excerpted copy of the August 11, 2017 deposition of John Bares.

4. Attached as Exhibit 3 is a true and correct copy of document produced by Uber in this case bearing Bates number UBER00006451.

5. Attached as Exhibit 4 is a true and correct copy of document produced by Uber in this case bearing Bates number UBER00059911.

6. Attached as Exhibit 5 is a true and correct excerpted copy of the August 16, 2017 deposition of Benjamin Ingram.

7. Attached as Exhibit 6 is a true and correct excerpted copy of the September 26, 2017 deposition of Dr. Lambertus Hesselink.

8. Attached as Exhibit 7 is a true and correct copy of a document produced by Waymo in this case bearing Bates number WAYMO-UBER-00008167.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

DATED: January 26, 2018

/s Jeff Nardinelli
Jeff Nardinelli

SIGNATURE ATTESTATION

Pursuant to Local Rule 5-1(i)(3), I attest under penalty of perjury that concurrence in the filing of this document has been obtained from Jeff Nardinelli.

/s/ Charles K. Verhoeven
Charles K. Verhoeven

EXHIBIT 1

FILED UNDER SEAL

EXHIBIT 2

FILED UNDER SEAL

EXHIBIT 3

FILED UNDER SEAL

EXHIBIT 4

FILED UNDER SEAL

EXHIBIT 5

FILED UNDER SEAL

EXHIBIT 6

FILED UNDER SEAL

EXHIBIT 7

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